What is claimed is:

1. A method for attenuating the expression of a target gene in a cell comprising introducing into the cell a double stranded RNA in an amount sufficient to attenuate expression of the target gene, wherein the double stranded RNA comprises a nucleotide sequence that is essentially identical to the nucleotide sequence of at least a portion of the target gene.

2. The method of claim 1 wherein the target gene is an endogenous gene.

3. The method of claim 1 wherein the target gene is a foreign gene.

4. The method of claim 1 wherein the targeted gene is a chromosomal gene.

5. The method of claim 1 wherein the targeted gene is an extrachromosomal gene.

6. The method of claim 1 wherein the targeted gene is derived from a pathogen capable of infecting the cell.

7. The method of claim 6 wherein the pathogen is selected from the group consisting of a virus, bacterium, fungus or protozoan.

8. The method of claim 1 wherein the cell is a vertebrate cell.

9. The method of claim 8 wherein the vertebrate cell is a fish cell.

10. The method of claim 8 wherein the vertebrate cell is a mammalian cell.

11. The method of claim 10 wherein the mammalian cell is a murine cell.

12. The method of claim 10 wherein the vertebrate cell is an avian cell.

13. The method of claim 1 wherein the cell is an invertebrate cell.

14. The method of claim 1 wherein the cell is a plant cell.

15. The method of claim 1 wherein the double stranded RNA comprises a nucleotide sequence that is completely identical to the nucleotide sequence of at least a portion of the target gene.

16. The method of claim 1 in which the essentially identical nucleotide sequence is at least 50 bases in length.

17. The method of claim 1 wherein the double stranded RNA is administered in an amount sufficient to completely inhibit expression of the target gene.

18. The method of claim 1 in which the double stranded RNA comprises one strand which is self-complementary.

19. The method of claim 1 in which the double stranded RNA comprises two separate complementary strands.

20. The method of claim 1 wherein the cell is an embryo.

21. The method of claim 20 wherein the embryo is a fish embryo.

22. The method of claim 20 wherein the double stranded RNA is introduced into the embryo using microinjection.

23. The method of claim 1 wherein the cell is present in a cell culture, a tissue, an organ, or an organism.

24. The method of claim 23 wherein the cell is present in an organism, and the double stranded RNA is introduced into a body cavity or interstitial space of the organism.

25. The method of claim 23 wherein the cell is present in an organism, and wherein the double stranded RNA delivered to the organism via oral, topical, parenteral, vaginal, rectal, intranasal, ophthalmic, or intraperitoneal administration.

26. The method of claim 23 wherein the cell is present in a cell culture or a tissue explant, and wherein introduction of the double stranded RNA into the cell comprises incubating the cell culture or tissue explant in a solution comprising the double stranded RNA.

27. The method of claim 1 wherein the double stranded RNA is treated with RNAse prior to its introduction into the cell.

28. The method of claim 1 further comprising, prior to introducing the double stranded RNA into the cell, annealing two complementary single stranded RNAs to yield the double stranded RNA.

29. The method of claim 1 wherein the complementary single stranded RNAs are annealed in the presence of potassium chloride.

30. The method of claim 1 wherein the function of the target gene is unknown.

31. The method of claim 1 further comprising introducing into the cell a second double stranded RNA in an amount sufficient to attenuate expression of a second target gene, wherein the second double stranded RNA comprises a nucleotide sequence that is essentially identical to the nucleotide sequence of at least a portion of the second target gene.

32. The method of claim 1 comprising introducing into the cell multiple double stranded RNAs in an amount sufficient to attenuate expression of multiple target genes, wherein each double stranded RNA comprises a nucleotide sequence that is essentially identical to the nucleotide sequence of at least a portion of a target gene.

33. A method for attenuating the expression of a target gene in an organism comprising:

introducing a double stranded RNA into an embryo in an amount sufficient to attenuate expression of the target gene, wherein the double stranded RNA comprises a nucleotide sequence that is essentially identical to the nucleotide sequence of at least a portion of the target gene;

growing the embryo into an adult organism in which expression of the target gene is attenuated.

34. The method of claim 33 wherein the organism is a vertebrate.

35. The method of claim 33 further comprising identifying a phenotypic change in the organism associated with attenuated expression of the target gene.

36. The method of claim 33 wherein expression of the target gene in the organism is completely inhibited.

37. A method for attenuating the expression of a target gene in cell culture comprising:

introducing a double stranded RNA into a cell in an amount sufficient to attenuate expression of the target gene, wherein the double stranded RNA comprises a nucleotide sequence that is essentially identical to the nucleotide sequence of at least a portion of the target gene; and

culturing the cell to yield a cell culture in which expression of the target gene is attenuated.

38. The method of claim 37 wherein the cell is a vertebrate cell.

39. The method of claim 37 further comprising identifying a phenotypic change in the cell culture associated with attenuated expression of the target gene.

40. The method of claim 37 wherein expression of the target gene in the cell culture is completely inhibited.

41. A method for attenuating the expression of a target gene in a tissue explant comprising:

explanting a tissue from an organism; and

introducing a double stranded RNA into a cell of the tissue explant in an amount sufficient to attenuate expression of the target gene, wherein the double stranded RNA comprises a nucleotide sequence that is essentially identical to the nucleotide sequence of at least a portion of the target gene.

42. The method of claim 41 wherein the tissue explant exhibiting attenuated expression of the target gene is implanted back into the organism.

43. The method of claim 41 wherein the tissue explant exhibiting attenuated expression of the target gene is implanted into a second organism.

44. The method of claim 41 wherein the tissue is fetal tissue.

45. The method of claim 41 wherein the organism is a vertebrate.

46. The method of claim 41 further comprising identifying a phenotypic change in the tissue explant associated with attenuated expression of the target gene.

47. The method of claim 41 wherein expression of the target gene in the organism is completely inhibited.

48. A method for attenuating the expression of a target gene in a cell comprising:

annealing two complementary single stranded RNAs in the presence of potassium chloride to yield double stranded RNA;

contacting the double stranded RNA with RNAse to purify the double stranded RNA by removing single stranded RNA; and

introducing the purified double stranded RNA into the cell in an amount sufficient to attenuate expression of the target gene;

wherein the double stranded RNA comprises a nucleotide sequence that is essentially identical to the nucleotide sequence of at least a portion of the target gene.

49. A method for treating or preventing a disease or infection in a mammal comprising:

identifying a target gene, wherein expression of the target gene is associated with the disease or infection; and

administering to the mammal a double stranded RNA in an amount sufficient to attenuate expression of the target gene;

wherein the double stranded RNA comprises a nucleotide sequence that is essentially identical the nucleotide sequence of at least a portion of the target gene.

50. The method of claim 49 for treating or preventing a viral infection, wherein the double stranded RNA is an antiviral double stranded RNA that attenuates the expression of a viral gene.

51. The method of claim 49 for treating or preventing cancer, wherein the double stranded RNA is an antitumor double stranded RNA.

52. The method of claim 49 for treating an autosomal dominant genetic disease wherein the double stranded RNA attenuates the expression of an allele of a gene that is associated with the disease.

53. The method of claim 52 wherein the disease is Huntington's chorea.

54. The method of claim 49 comprising:
identifying a plurality of target genes, wherein expression of the target genes is associated with the disease or infection; and
concurrently administering to the mammal a plurality of double stranded RNAs in an amounts sufficient to attenuate expression of the target genes;
wherein each double stranded RNA comprises a nucleotide sequence that is essentially identical the nucleotide sequence of at least a portion of a target gene.

55. The method of claim 49 further comprising:
identifying a second target gene, wherein expression of the second target gene is associated with a second disease or infection; and
administering to the mammal a second double stranded RNA in an amount sufficient to attenuate expression of the second target gene concurrent with the administration of the first double stranded RNA;
wherein the second double stranded RNA comprises a nucleotide sequence that is essentially identical the nucleotide sequence of at least a portion of the second target gene.

56. A method for reducing or preventing the rejection response to transplant tissue comprising administering to the transplant tissue a double stranded RNA that attenuates the expression of a gene in the transplant tissue that can elicit an immune response in the recipient.

57. The method of claim 56 wherein the transplant tissue is hepatocytes.

58. A vertebrate cell comprising a double stranded RNA comprising a nucleotide sequence that is essentially identical to the nucleotide sequence of at least a portion of a target gene.

59. The vertebrate cell of claim 58 selected from the group consisting of a fish cell, a murine cell, a bird cell and a human cell.

60. A vertebrate comprising the cell of claim 58.

61. A kit comprising reagents for attenuating the expression of a target gene in a cell, the kit comprising:
a DNA template comprising two different promoters selected from the group consisting of a T7 promoter, a T3 promoter and an SP6 promoter, each promoter operably linked to a nucleotide sequence, such that two complementary single stranded RNAs are capable of being transcribed from the DNA template, and wherein the complementary single stranded RNAs comprise a nucleotide sequence that is essentially identical to the nucleotide sequence of at least a portion of the target gene;
a plurality of primers for amplification of the nucleotide sequence;
nucleotide triphosphates for forming RNA;
at least two RNA polymerases, each capable of binding to a promoter on the DNA template and causing transcription of the nucleotide sequence to which the promoter is operably linked;
a purification column for purifying single stranded RNA;
buffer for annealing single stranded RNAs to yield double stranded RNA; and
RNAse A or RNAse T for purifying double stranded RNA.